



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,568	12/08/2003	Dong-Jae Shin	5000-1-485	3059
33942	7590	12/01/2005	EXAMINER	
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			UNELUS, ERNEST	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

21

<b>Office Action Summary</b>	<b>Application No.</b> 10/730,568	<b>Applicant(s)</b> SHIN ET AL.	
	<b>Examiner</b> Ernest Unelus	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12 and 13 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 8, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "injecting spectrum-spliced incoherent light" is indefinite.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,055,252) in view of the applicant's prior art.

With respect to claim 1, Zhang discloses a WDM Fabry perot laser where a bias controlling unit for adjusting a bias current supplied to the Fabry perot laser to a value adjacent to a threshold current of the Fabry-perot laser, whose threshold current is changed according to a temperature (see fig. 2, col. 4, lines 23-50, and col. 8, line 9). In

regards to a relationship between the injected light changed depending to a temperature and a wavelength of the oscillation mode, it's inherent that threshold current depends on the oscillation mode wavelength; this in turn depends on the injected light, which is depended on temperature. Therefore, it is also inherent that the threshold current is depended on and this changed according to the relationship between the oscillation mode wavelength and injected light changed by temperature. Zhang fail to further disclose that the Fabry-perot laser is injecting spectrum-spliced incoherent light to amplify and output only oscillation mode matching with a wavelength of the injected light. However, the applicant's prior art discloses a Fabry-perot laser for injecting spectrum-spliced incoherent light to amplify and output only oscillation mode matching with a wavelength of the injected light. It would have been obvious to one having ordinary skill in the art at the time of invention to combine the two references above, simply, to increase the number of wavelength-divided channels, as indicated by the applicant's prior art.

With respect to claim 2, Zang and the applicant's prior art disclose everything as claimed above. In addition, Zhang discloses a threshold current sensor for sensing the threshold current of the Fabry-perot laser; and a bias controller for adjusting the bias current supplied to the Fabry perot laser depending on the sensed threshold current (see col.5, lines 46-63).

With respect to claim 8, Zhang discloses; measuring a threshold current of the

Art Unit: 2828

Fabry Perot laser, whose threshold current is changed according to a temperature (see fig. 2 and col. 1, line 19); and supplying a bias current having a value adjacent to the threshold current to the Fabry perot laser (see fig. 2). In regards to a relationship between injected light changed depending to a temperature and a wavelength of oscillation mode, it's inherent that threshold current depends on the oscillation mode wavelength; this in turn depends on the injected light, which is depended on temperature. Therefore, it is also inherent that the threshold current is depended on and this changed according to the relationship between the oscillation mode wavelength and injected light changed by temperature. Zhang fail to specifically indicate the injecting spectrum-spliced incoherent light into the Fabry perot laser. Injecting spectrum-spliced incoherent light into the Fabry Perot laser is well taught by the applicant's prior art. It would have been obvious to one having ordinary skill in the art at the time of invention to combine the two references above, simply, to modulate the laser into the fiber network for the purpose of wavelength division, as indicated by the applicant prior art.

With respect to claim 10, Zang and the applicant's prior art disclose everything as claimed above. In addition, Zhang discloses measuring a change of optical power of the Fabry perot laser (see col. 8, lines 18-22).

With respect to claim 12, Zhang discloses measuring a threshold current of the Fabry perot laser (see col. 1, line 19). In regards to the threshold current is changed according to various temperatures and a relationship between injected light changed depending to a temperature and a wavelength of oscillation mode, it's inherent that

Art Unit: 2828

threshold current depends on the oscillation mode wavelength; this in turn depends on the injected light, which is depended on temperature. Therefore, it is also inherent that the threshold current is depended on and this changed according to the relationship between the oscillation mode wavelength and injected light changed by temperature; Zhang discloses a working temperature of the Fabry Perot laser (see col. 1, line 42), converting the temperature and the threshold current corresponding to the temperature into data and for storing the data (see col. 1, lines 50-63). Supplying a bias current to the Fabry-perot laser using the stored data (see col. 1, lines 50-63), the bias current having a value adjacent to a threshold current corresponding to the working temperature of the Fabry Perot laser (see fig. 2, col. 4, lines 23-50). Zhang fail to further disclose injecting spectrum-spliced incoherent light into the Fabry-perot. However, the applicant's prior art discloses injecting spectrum-spliced incoherent light into the injecting spectrum-spliced incoherent light into the Fabry-perot. It would have been obvious to one having ordinary skill in the art at the time of invention to combine the two references above, simply, to increase the number of wavelength-divided channels, as indicated by the applicant's prior art.

Claims 3, 9, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,055,252) in view of the applicant's prior art and further in view of Han et al. (US 2004/0213574).

With respect to claims 3, 9, and 13, Zhang and the applicant's prior art disclose everything as claimed above without specifically indicating the bias controlling unit controls the bias current supplied to the Fabry perot laser to have a value between at least one half and at most one and half of the threshold current of the Fabry perot laser. The bias controlling unit controls the bias current supplied to the Fabry perot laser to have a value between at least one half and at most one and half of the threshold current of the Fabry perot laser is well taught by Han (see par. 0035). It would have been obvious to one having ordinary skill in the art at the time of invention to have the bias current supplied to the Fabry perot laser to have a value between at least one half and at most one and half of the threshold current of the Fabry perot laser, simply, to stabilized the output power of the laser, as indicated by Han (see paragraph 0035).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 6,055,252) in view of the applicant's prior art and further in view of Suda (US 6,324,197).

With respect to claim 4, Zhang and the applicant's prior art disclose everything as claimed above without specifically indicating the threshold current sensor includes an optical power sensor for sensing the threshold current of the Fabry-perot laser based on a change of optical power of the Fabry perot laser. The threshold current sensor with an optical power sensor for sensing the threshold current of the Fabry-perot laser based on a change of optical power of the Fabry perot laser is well taught by Suda; this is in

Art Unit: 2828

consideration that a sensor is disclosed in a photodiode (see col. 2, lines 40-45). It would have been obvious to one having ordinary skill in the art at the time of invention to include a power sensor for sensing the threshold current of the Fabry-perot laser based on a change of optical power of the Fabry perot laser, simply, to control an output current of an electric current power source for electrically energizing the laser diode, as indicated by Suda (see col. 2, lines 36-39).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US pat. 6,055,252) in view of the applicant's prior art, Lee et al. (US pub. 2003/0206740), and further in view of King et al. (US pat. 5,812,572).

With respect to claim 7, Zhang discloses a WDM Fabry perot laser where a bias controlling unit for adjusting a bias current supplied to the Fabry perot laser to a value adjacent to a threshold current (see fig. 2, col. 4, lines 23-50, and col. 8, line 9). Zhang also discloses that the threshold current is changed according to a temperature (see col. 1, lines 37-38) Zhang fail to disclose a Fabry Perot laser for suppressing an oscillation mode mismatched with a wavelength of injected light and for amplifying and outputting only an oscillation mode matching with the wavelength of the injected light; a wavelength division multiplexer for spectrum-splicing light, which is generated from the light source, to provide the spectrum-spliced light to the Fabry Perot laser as injecting light, and for multiplexing a wavelength-locked signal wavelength-locked by the Fabry Perot laser; a circulator for inputting the light generated from the light source into the



Art Unit: 2828

wavelength division multiplexer, and for outputting a multiplexed signal multiplexed by the wavelength division multiplexer to a transmission link; and a threshold current sensor for sensing a threshold current of the Fabry Perot laser. However, the applicant's prior art discloses a Fabry Perot laser for suppressing an oscillation mode mismatched with a wavelength of injected light and for amplifying and outputting only an oscillation mode matching with the wavelength of the injected light; a wavelength division multiplexer for spectrum-splicing light, which is generated from the light source, to provide the spectrum-spliced light to the Fabry Perot laser as injecting light, and for multiplexing a wavelength-locked signal wavelength-locked by the Fabry Perot laser. A circulator for inputting the light generated from the light source into the wavelength division multiplexer, and for outputting a multiplexed signal multiplexed by the wavelength division multiplexer to a transmission link is well taught by Lee (see fig. 8 and paragraph 0124). A threshold current sensor for sensing a threshold current of the Fabry Perot laser is well taught by King (see col. 8, lines 1-3). It would have been obvious to one having ordinary skill in the art at the time of invention to combine the above references above, simply, to increase the number of wavelength-divided channels, as disclose by the applicant's prior art.

### ***Allowable Subject Matter***

Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the

indication of allowable subject matter: the prior art of record, taken alone or in combination, fails to disclose or render obvious, wherein the threshold current sensor includes an impedance sensor for sensing the threshold current of the Fabry perot laser based on a change of impedance of the Fabry perot laser.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Eda et al. (US pat. 5,438,579) disclose a wavelength stability apparatus without specifically disclosing a impedance sensor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernest Unelus whose telephone number is 571-272-8596. The examiner can normally be reached on 9:00am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business

Application/Control Number: 10/730,568

Page 10

Art Unit: 2828

Center (EBC) at 866-217-9197 (toll-free).

E.U

*Supervisory*  
*Zandra V. Smith*  
ZANDRA V. SMITH  
PRIMARY EXAMINER  
11/28/05